Conclusion: Nuclear medicine professionals should pay attention to the quality control of CT doses delivered by hybrid devices.

P15

MONITORING OF THE INTRINSIC RADIATION LOAD IN SCANOMED DEBRECEN LTD. BASED ON THE YEAR OF 2012

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In the case of those institutions which work with open radioactive products, the used isotopes can get into the bodies of the personnel and can accumulate there. The possibility of this internal contamination can be estimated on each radionuclid according to the International Atomic Energy Agency (IAEA, Safety Guide, No. RS-G-1.2, Vienna, 1999). On the grounds of the year of 2012 in ScanoMed Debrecen Ltd., "d" decision factors were calculated to all used isotope types. In these estimations, the annual utilized amount, the physical-chemical form, the operation with the isotope, the factor of inhalation dose and the relative safety factor to protection were taken into account. If the "d" value is ≥ 1 (eg.: the d is equal with 12,1 for Tc-99m) personal controlling had to be performed. This can be executed by routine examination or ad hoc measurement. In the case of the former the internal contamination can not be connected for a given operation, while for the latter occasion the danger of radioactive contamination belongs to a session which is separated and well-defined in time. For the diagnose of internal contamination, the place of the isotope accumulation defines which examination is sufficient; either whole body analysis (eg.: Tc-99m) or given organic mapping (eg.: I-131 accumulation in the thyroid). This study due to the wide spectra and high annual amount of isotopes used by the ScanoMed Debrecen Ltd. provide valued data in connection with radiation protection.

P16

THE IMPORTANCE OF CURVE PARAMETERS OF RENOGRAPHY IN FOLLOWING OF NEPHROTOXICITY CAUSED BY RADIOTHERAPY IN GASTRIC CANCER PATIENTS

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Background: Postoperative chemoradiotherapy improves locoregional control and survival in gastric cancer patients. Renal toxicity is one of the most serious complications of upper abdominal radiotherapy, which should be reduced as low as possible.
The aim of this study was to analyse the changes of separate kidney function and the assessment of damage based on curve parameters in patients undergoing postoperative chemoradiotherapy in gastric cancer.
Material and methods: Between 2006 and 2011 baseline radiorenography (99mTc-ethylene-dicysteine) was performed in 33 patients with gastric cancer (age: 39–79; average age 60.51 years) after surgery, but before postoperative chemotherapy and conformal radiotherapy. The in-damage kidney to in-safe kidney (D/S) ratio was used as an index of relative kidney function and curve parameters (T1/2 and Tmax values) were examined, which were taken in account during the planning of radiotherapy. In-damage kidneys received an average of 26.5 ± 10.1 Gy, while in-safe kidneys received an average of 5.6 ± 3.0 Gy dose. Control renography was performed within 6–24 months in 23 patients, within 24–60 months in 13 patients after postoperative radiotherapy
Results: The function of in-damage kidney decrease significantly and progressive in time, the decrease depended on received dose ($r = 0.610$, $p = 0.026$). The D/S ratio change most significant ($p < 0,001$) control renography was performed within 6–24. In case of control examination within 24–60 months T1/2 values became significantly elongated after radiotherapy ($p = 0.032$) indicating mild impairment of renal function. Tmax value of the in-damage kidney was significantly deviated from Tmax value of in-safe kidney ($r = 0.210$; $p = 0.005$) in the whole patient group. The change of Tmax value proved to be independent of received dose. Curve parameters of in-safe kidney did not show change compared with baseline study. Harmful effect of chemotherapy was not detected.
Conclusion: Despite receiving some radiation dose, the function of in-safe kidney did not worsen. The relative function impairment of the in-damaged kidney in patients following postoperative radiotherapy for gastric cancer is demonstrated. After postoperative radiotherapy renography is useful to monitor the condition of the damaged kidney in case of long survival. Curve parameters indicate neprotoxicity caused by radiotherapy earlier than decrease of D/S ratio, which can be interpreted by early deterioration of tubular cell function and latter cell-death. The radiotherapy planning could be improved by our investigation.

P17

SIGNIFICANCE OF SPECT/CT IN THE DETECTION OF PARATHYROID ADENOMAS

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Background: In most patients there are parathyroid adenomas in the background of hyperparathyreosis, the adequat therapy of which is surgical removal. Therefore precise anatomical localization is crucial in these cases. Is 99mTc-MIBI (methoxy-isobutyl-isonitryl) scintigraphy complemented by SPECT/CT suitable for this purpose?
Material and methods: Static imaging of the neck and mediastinum was performed following iv. administration of 370 MBq 99mTc-MIBI in the 15th and 120th minutes with subtraction pictures in both phases and 60 minutes after the administration an additional SPECT/CT scan was carried out. In the majority of cases 99mTc-pertechnetate thyroid scintigraphy was also performed one day before or after MIBI scintigraphy.
Patients: One hundred fourty three patients were examined between 2007–2012. Among them there were 41 men (average age 48 years) and 102 women (average age 59 years), with the age range 6–85 years.
Results: Static parathyroid scintigraphy, SPECT and native CT examinations were positive in 56 patients, however all examinations gave negative results in 44 patients. In 19 patients static MIBI scintigraphy was negative, whereas SPECT and native CT scan were positive. In 10 cases static image was positive, but SPECT and native CT examinations did not detect the parathyroid adenoma. In 8 patients the results of SPECT and native CT were in conflict, consequently further examinations (MRI, US) were suggested.
Conclusions: Additional SPECT/CT imaging gave positive results in 52% of examinations and confirmed and localized the parathyroid adenomas. Of these in 13% of cases parathyroid adenomas not detected by the static picture were localized by SPECT/CT scan. Consequently, SPECT/CT examination plays a significant role in the detection and localization of parathyroid adenomas.